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Contact us:

USDA-ARS-NSDL  
411 S. Donahue Dr.  
Auburn, AL 36832  
334-844-4741

<http://msa.ars.usda.gov/al/auburn/nsdl/csr>



# Conservation Systems Research

## *Cotton Systems Research: Evaluating Herbicide Technologies, Tillage Systems, and Row Spacings*

### RESEARCH PROJECT DESCRIPTION NO. 46



Ultra-narrow, 15-inch rows.



Standard, 40-inch rows.

Weed suppression in ultra-narrow row, conservation tillage systems may lower seed and chemical costs.

### Researchers

K.S. Balkcom (Research Agronomist), A.J. Price (Weed Scientist), F.J. Arriaga (Soil Scientist), D.P. Delaney (Extension Specialist, Auburn University), Y. Feng (Soil Microbiologist, Auburn University)

### The Challenge

Most cotton produced in the southeastern USA is currently planted at traditional row widths, such as 40-inches. Narrower row widths increase plant populations by maintaining in-row seed spacing, promote faster cotton canopy closure, water conservation, soil protection, and weed suppression, and generally increase yields. Ultra-narrow row cotton systems (UNRC), with row widths of 7.5- to 15-inches, have received increased interest among growers.

UNRC production has had limited success because of equipment limitations. In the past, UNRC was harvested with a stripper-picker

that increased trash contents, resulting in penalties that eliminated the economic benefit of UNRC.

Advances in harvest equipment design may allow UNRC growers to produce cleaner harvests and eliminate penalties.

A major benefit of UNRC systems, combined with high-residue conservation tillage systems, is weed suppression. Faster canopy closure in UNRC may delay weed emergence, providing an advantage to the crop, and significantly reduce weed pressure. Increased weed suppression may lead to reduced amounts of herbicides and lower costs for chemicals and seeds. The economics of a conservation tillage UNRC system may make conventional cotton varieties more competitive with the more expensive, herbicide-tolerant varieties.

## The Experiment

A three-year experiment was initiated in the fall of 2003 at the Alabama Agricultural Experiment Station's E.V. Smith Research Center, near Milstead, to evaluate the effects of two tillage systems, two row spacings, and three cotton varieties on cotton yield, fiber quality, soil moisture, weed management, and profitability. Tillage system effects

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on microbial degradation of herbicides are also being studied.

A cover crop mixture (60% rye and 40% black oat) will be planted each fall across all treatments and terminated each spring. Three cotton varieties (glyphosate-

resistant, glufosinate-resistant, and conventional) will be planted in conventional tillage and reduced-tillage systems for standard (40-inch) and UNRC (15-inch) planting patterns.

Data collected will include seed cotton yield, gin turnout, and fiber quality; weed diversity and biomass; cover crop carbon, nitrogen, and biomass; soil moisture (determined hourly during the cotton growing season at 16-inch depth); herbicide degradation; and economic returns.



Planting UNRC into cover crop residue.